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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/705,929

11/13/2003

Wei-Tai Cheng

BHT-3137-34

6568

7590

09/28/2004

TROXELL LAW OFFICE PLLC
SUITE 1404
5205 LEESBURG PIKE
FALLS CHURCH, VA 22041

EXAMINER

TRINH, HOA B

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 09/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/705,929	Applicant(s) CHENG ET AL.	
	Examiner Vikki H Trinh	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-8, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) , figures 7-8, in view of Wang (6,469,324).

APA discloses a LED having a plurality of reflective layers 8 (fig. 7) stacked to form a reflection structure; a transparent substrate formed on top of the reflective layers; an N type semiconductor layer 6 formed on the substrate; a light emitting layer 62 formed on the N-type layer; a P type 7 semiconductor layer formed on the light emitting layer 62; wherein the reflective layers is formed to receive and reflect light at different angles so that it can enhance the light reflection of the LED.

However, APA is silent about the reflective layers has a distributed Bragg reflector (DBR).

Wang teaches a LED having a substrate, a light emitting layer in the active region 12, and a stack of DBR reflective layers 20 (fig. 2). Wang also teaches that the reflection structure 20, 18 are made of oxides (col. 4, lines 33-35).

Therefore, as to claim 1-3 and 5-7 and 11, it would have been obvious to one having ordinary skill in the art at the time the invention was made, in view of Wang, to modify the reflective layers in APA with DBR reflective layers, as taught by Wang, so as to reduce light absorption by the substrate (Wang, col. 2, line 8).

As to claim 4, Wang teaches the reflection structure 20, 182 being made with oxides (col. 4, lines 33-35). However, Wang does not teach that the reflection structure has compounds selected from a group consisting of oxides, carbides, nitrides, and fluorides. Nonetheless, it

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would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of Wang with compounds selected from a group of nonmetal materials to includes carbides, fluorides, and nitrides, aside from the oxides, so as to provide additional options in selecting the compound.

As to claims 8 and 10, Wang teaches that the LED is made of ALGaInP (col. 1, line 26), and the reflective layers are made of AlInP, AlGaInP, and GaAs (col. 2, lines 55-65). However, Wang does not explicitly teach that the reflective layers are selected from a group that also includes AlAs. Nonetheless, it is a prima facie obvious to an artisan at the time the invention was made to further include in the material selection for the reflective layers of Wang with AlAs, so as to provide an additional option for the reflective layers.

4. Claims 1-3, 5-7, 9, and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) , figures 7-8, in view of Chien et al. (6,492,661).

APA discloses a LED having a plurality of reflective layers 8 (fig. 7) stacked to form a reflection structure; a transparent substrate formed on top of the reflective layers; an N type semiconductor layer 6 formed on the substrate; a light emitting layer 62 formed on the N-type layer; a P type 7 semiconductor layer formed on the light emitting layer 62; wherein the reflective layers is formed to receive and reflect light at different angles so that it can enhance the light reflection of the LED. Note that figure 8 shows the substrate being under the reflective structure.

However, APA is silent about the reflective layers has a distributed Bragg reflector (DBR).

Chien teaches a LED having a substrate, a light emitting layer in the active region 22, and a stack of DBR reflective layers 33 (fig. 2). Chien also teaches that the LED is made of InGaN

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and the reflective layers have compounds selected from a group consisting of InGaN, AlGaIn and GaN. (col. 7, lines 40-46)

Therefore, as to claim 1-3, 5-7, 9 and 10-11, it would have been obvious to one having ordinary skill in the art at the time the invention was made, in view of Wang, to modify the reflective layers in APA with DBR reflective layers, as taught by Chien, so as to reduce light absorption by substrate.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 5-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Schubert (6,784,462).

As to claims 5-7, Schubert discloses a LED having a substrate 3 (fig. 1); a stacked reflective layers 8 having a DBR (col. 1, line 62); an N type semiconductor layer 5 (fig. 1) or 126 formed on the reflective layers; a light emitting layer 4 (fig. 1) or 124 formed on the N type layer; and a P type 5 (fig. 1) or 125 on the light emitting layer; wherein the reflective layers reflect light as claimed. See also fig. 8, col. 1, lines 22, col. 3, lines 50-60, and attachment.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Vikki Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached from Monday-Friday, 9:00 AM - 5:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Wael Fahmy, can be reached at (571) 272-1705. The office fax number is 703-872-9306.

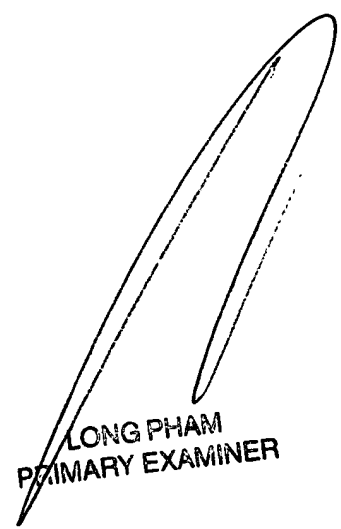
Any request for information regarding to the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Also, status information for published applications may be obtained from either Private PAIR or Public Pair. In addition, status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspro.gov>. If you have questions pertaining to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

Lastly, paper copies of cited U.S. patents and U.S. patent application publications will cease to be mailed to applicants with Office actions as of June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for

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information on this policy. Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

Vikki Trinh,
Patent Examiner
AU 2814



LONG PHAM
PRIMARY EXAMINER